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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,266	06/23/2006	Masato Iwanaga	062698	5652
38834	7590	11/08/2011		
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP			EXAMINER	
1250 CONNECTICUT AVENUE, NW			ROE, CLAIRE LOUISE	
SUITE 700			ART UNIT	PAPER NUMBER
WASHINGTON, DC 20036			1727	
		NOTIFICATION DATE	DELIVERY MODE	
		11/08/2011	ELECTRONIC	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASATO IWANAGA, HIDEYUKI INOMATA,
KEISUKE OOGA, KOJI ABE, and KAZUHIRO MIYOSHI

Appeal 2010-007878
Application 10/584,266
Technology Center 1700

Before TERRY J. OWENS, JEFFREY T. SMITH, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-8, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

The Invention

The Appellants claim a nonaqueous electrolyte secondary battery.

Claim 1 is illustrative:

1. A nonaqueous electrolyte secondary battery comprising:

a negative electrode constituted of a carbonaceous material permitting reversible insertion and desorption of lithium;

a positive electrode permitting reversible insertion and desorption of lithium;

a separator separating the positive electrode and negative electrode from each other; and

a nonaqueous electrolyte composed of an organic solvent with a solute of lithium salt dissolved therein;

said nonaqueous electrolyte containing vinylene carbonate and di(2-propynyl) oxalate, and said vinylene carbonate being added in an amount of 0.1 to 3.0% by mass, and said di(2-propynyl) oxalate in an amount of 0.1 to 2.0% by mass, relative to the mass of said nonaqueous electrolyte.

The References

Kinoshita	2004/0091780 A1	May 13, 2004
Noh	2004/0101762 A1	May 27, 2004
Hamamoto (as translated)	JP 2002124297 A	Apr. 26, 2002
Kanekiyo (as translated)	JP 2002313419	Oct. 25, 2002

The Rejections

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1 and 8 over Hamamoto in view of Noh, claims 2-6 over Hamamoto in view

of Noh and Kanekiyo, and claim 7 over Hamamoto in view of Noh and Kinoshita.

OPINION

We affirm the rejections. Because our rationale differs substantially from that of the Examiner we denominate the affirmance as involving a new ground of rejection under 37 C.F.R. § 41.50(b).

The Appellants state that claims 2-8 stand or fall with claim 1, which is the sole independent claim (Br. 7). We therefore limit our discussion to claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007). That claim requires a nonaqueous electrolyte containing, by mass, 0.1-3.0% vinylene carbonate and 0.1-2.0% di(2-propynyl) oxalate.

Noh discloses a nonaqueous electrolyte secondary battery comprising a carbonaceous negative electrode and a positive electrode, each of which permits reversible insertion and desorption of lithium, a separator separating the positive and negative electrodes from each other, and a nonaqueous electrolyte solution comprising an organic solvent, a lithium salt solute, an additive compound having at least two carbonate groups, and a secondary additive which can be vinylene carbonate in a preferred amount of 0.1-10 wt% (¶¶ 0013, 0020-21, 0039). The electrolyte solution improves cycle life and inhibits swelling at a high temperature (¶ 0011).

Hamamoto discloses a lithium secondary battery comprising a positive electrode and a carbonaceous negative electrode which can occlude and discharge lithium, a separator separating the positive and negative electrodes from each other, and a nonaqueous electrolyte solution comprising an organic solvent, a lithium salt solute and an alkyne derivative which can be di(2-propynyl) oxalate in a preferred amount of 0.1-10 wt%

(¶¶ 0008-9, 0016-21, 0025-26). The organic solvent can comprise vinylene carbonate (¶ 0018-19). The alkyne derivative coats the surface of the carbonaceous negative electrode, thereby preventing reduction and decomposition of the organic solvent at the electrode which would reduce the battery's cycle, electrical capacity and storage properties (¶¶ 0003-4, 0011).

It would have been *prima facie* obvious to one of ordinary skill in the art to include any amount within Hamamoto's 0.1-10 wt% of di(2-propynyl) oxalate, such as 0.1-3% wt%, in Noh's electrolyte solution to obtain the benefit thereof disclosed by Hamamoto, i.e., coating the carbonaceous negative electrode so as to prevent reduction and decomposition of the organic solvent at the electrode and thereby improve the battery's cycle, electrical capacity and storage properties (Hamamoto, ¶¶ 0003-4, 0011). Also, it would have been *prima facie* obvious to one of ordinary skill in the art to substitute Noh's organic solvent/additive/secondary additive, including combinations wherein the secondary additive is vinylene carbonate in an amount within the preferred 0.1-10 wt% range, such as 0.1-3 wt%, for Hamamoto's organic solvent which can comprise esters and vinylene carbonate and to which the alkyne derivative is added (¶¶ 0018-19, 0021), to obtain the benefit of that combination disclosed by Noh, i.e., improved battery cycle life and inhibited swelling at high temperature (¶¶ 0020-21, 0039).

The Appellants argue, in reliance upon Noh's examples, that adding vinylene carbonate alone to an electrolyte does not control swelling (Br. 10-11; Reply Br. 1-4).

Regardless of whether Noh shows that vinylene carbonate alone inhibits swelling, a comparison of Noh's Examples 4-8 with Noh's Comparative Examples 1-3 shows that an electrolyte solution containing a combination of Noh's organic solvent, additive and 1 or 2 wt% vinylene carbonate provides less swelling than an electrolyte solution which does not include that combination. Hence, it would have been *prima facie* obvious to one of ordinary skill in the art to add Hamamoto's di(2-propynyl) oxalate to Noh's combination or to substitute Noh's combination for Hamamoto's organic solvent to which the di(2-propynyl) oxalate is added, in order to obtain the combined benefits of Noh's combination and Hamamoto's di(2-propynyl) oxalate, i.e., improved swelling inhibition at high temperature and cycle life (Noh, ¶ 0020) and improved battery cycle, electrical capacity and storage properties (Hamamoto, ¶¶ 0003-4, 0011).

The Appellants argue that the evidence in the Appellants' Specification's Table 1 (Spec. 10-11) shows unexpected results (Br. 11-12).

For the following reasons the totality of the evidence, including the Appellants' relied-upon evidence of unexpected results, does not support a conclusion of nonobviousness.

First, the Appellants' showing of unexpected results does not provide a comparison of the claimed invention with the closest prior art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). The Appellants have not identified the closest prior art and compared to it, or explained why their comparative examples are closer than the closest prior art.

Second, it is not enough for the Appellants to show that the results for the Appellants' invention and the comparative examples differ. The

difference must be shown to be an unexpected difference. *See In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). The Appellants' Specification does not state that the comparative results therein would have been unexpected by one of ordinary skill in the art. The Appellants have provided mere attorney argument to that effect, and arguments of counsel cannot take the place of evidence. *See De Blauwe*, 736 F.2d at 705.

Thus, we are not persuaded of reversible error in the Examiner's rejections. Because our rationale in affirming the rejections differs substantially from that relied upon by the Examiner we denominate the affirmance as involving a new ground of rejection under 37 C.F.R. § 41.50(b).

37 C.F.R. § 41.50(b) provides that the appellant, *WITHIN TWO MONTHS FROM THE DATE OF THE DECISION*, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

DECISION/ORDER

The rejections under 35 U.S.C. § 103 of claims 1 and 8 over Hamamoto in view of Noh, claims 2-6 over Hamamoto in view of Noh and Kanekiyo, and claim 7 over Hamamoto in view of Noh and Kinoshita are

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affirmed. The affirmance is denominated as involving a new ground of rejection under 37 C.F.R. § 41.50(b).

It is ordered that the Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED, 37 C.F.R. § 41.50(b)

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